WHAT IS CLAIMED IS:

1. A method of manufacturing an electric wiring of a semiconductor device including a semiconductor element formed on a semiconductor substrate and an aluminum alloy wiring connected to the semiconductor element on the semiconductor substrate, the method comprising:

forming an aluminum alloy layer on the semiconductor substrate, the aluminum alloy layer containing metal which restricting an movement of aluminum;

forming TiN film on the aluminum alloy layer by using spattering, a DC power of the spattering is set to equal to or less than 5.5 W/cm^2 so that a formed TiN film being rich with reactivity.

2. The method of manufacturing an electric wiring according to claim 1, wherein the TiN film is formed to have a thickness of 5 nm or more.

3. The method of manufacturing an electric wiring according to claim 1, wherein the TiN film is formed under a condition where a temperature of an atmosphere surrounding the semiconductor substrate during the spattering is approximately 180 ℃ or less.

4. A method of manufacturing an electric wiring of a semiconductor device including a semiconductor element formed

on a semiconductor substrate and an aluminum alloy wiring connected to the semiconductor element on the semiconductor substrate, the method comprising:

forming an aluminum alloy layer on the semiconductor substrate, the aluminum alloy layer containing metal which restricting an movement of aluminum;

forming TiN film on the aluminum alloy layer by using spattering, the spattering being conducted using TiN as a target and being conducted without containing N_2 gas in an atmosphere surrounding the semiconductor substrate.

5. The method of manufacturing an electric wiring according to claim 1, wherein the spattering is conducted by using TiN, formed on a surface of a Ti target, as the target of the spattering.

6. The method of manufacturing an electric wiring according to claim 5, wherein the step of forming TiN film on the aluminum alloy layer including:

first spattering the TiN film by using the TiN formed on the surface of the Ti target in the atmosphere without containing N_2 gas; and

second spattering another TiN film on the TiN formed in the first spattering in the atmosphere containing N_2 gas.

7. The method of manufacturing an electric wiring according to claim 4, wherein the step of forming TiN film on

the aluminum alloy layer including:

first spattering the TiN film by using the TiN formed on the surface of the Ti target in the atmosphere without containing N_2 gas; and

second spattering another TiN film on the TiN formed in the first spattering in the atmosphere containing N_2 gas, after the TiN is formed on an entire surface of the aluminum alloy layer in the first spattering.

8. The method of manufacturing an electric wiring according to claim 4, wherein the spattering is conducted in a condition where a DC power of the spattering is set to equal to or less than 5.5 W/cm^2 so that the formed TiN film is rich with reactivity.

9. A semiconductor device comprising:

a semiconductor substrate;

a semiconductor element formed on the semiconductor substrate; and

an aluminum alloy wiring connected to the semiconductor element on the semiconductor substrate, the aluminum alloy wiring including:

an aluminum alloy layer containing metal which restricting an movement of aluminum; and

a TiN film formed on the aluminum alloy layer and being rich with reactivity.

10. The semiconductor device according to claim 9, wherein plural reacted layers are formed in the aluminum alloy layer at an interface with the TiN film, each of the reacted layers is divided with each other to be dotted with the interface.

11. The semiconductor device according to claim 10, wherein the reacted layers extend from the TiN film into the aluminum alloy layer.

12. The semiconductor device according to claim 9, wherein AlN layer is formed at an interface between the aluminum alloy layer and the TiN film, the AlN layer has a composition that a composition ratio of aluminum is 1.5 or more when that of nitride is 1.

13. The semiconductor device according to claim 12, wherein the AlN layer has a thickness of 3.5 nm or less.

14. The semiconductor device according to claim 9, wherein the aluminum alloy layer includes a barrier layer, made up of AlN, on the aluminum alloy layer at an opposite side of the TiN layer.

15. The semiconductor device according to claim 14, wherein the aluminum is made of the TiN being rich with reactivity.